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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,497

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Devendra Y. Raut

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EXAMINER

CHOU, ALBERT T

ART UNIT

PAPER NUMBER

2416

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,497	<b>Applicant(s)</b> RAUT ET AL.	
	<b>Examiner</b> ALBERT T. CHOU	<b>Art Unit</b> 2416	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 September 2008 for the arguments.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's Remarks filed on September 12, 2008 have been entered. No claims have been amended. No claims have been canceled. No claims have been added. Claims 1-15 are pending in this application, with claims 1, 6 and 11 being independent.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 7,039,720 to Alfieri et al. (hereinafter "Alfieri") in view of US Patent No. 5,528,513 to Vaitzblit et al. (hereinafter "Vaitzblit")

Regarding claim 1, Alfieri teaches an edge router operating Border Gateway Protocol (BGP) in a packet network [**Figs. 1 & 5; Edge Routers 14 operating BGP in Wide Area Routed Network 10; col. 3, lines 8-22, col. 5, lines 28-30**] comprising:

a processor resource for processing events **[Fig. 5; multiple tasks 60 time-share the same physical processor in the Router 14 for processing task events; col. 6, lines 8-25];**

at least one scheduler **[Fig. 5; A context selection logic 64 is a task scheduler for scheduling tasks 60]** managing all events for processing by the processor resource **[Fig. 5; The time-sharing is accomplished in part via the context selection logic 64. As events occur that require action for a given VR, the context selection logic 64 couples the appropriate task 60 to the context area CTEXT for that VR. The task 60 then executes using the data from that context area CTEXT; col. 5, lines 35-43, col. 6, lines 30-36].**

Alfieri does not expressly teach the edge router comprises one ready list; and individual event pipelines dedicated to individual ones of BGP peers; wherein events received for processing are posted in their associated event pipelines according to the source of the events, pipelines having events to be processed insert a flag in the ready list, and the scheduler repetitively scans the ready list sequentially, and releases events to the processor resource with preset limitation per pipeline.

Vaitzblit teaches a scheduler with a weighted round-robin scheduling schemes in a network device **[Figs. 1-2; a Video File Server 20 having a Scheduler 53; col. 3, line 17]**, comprising:

at least one ready list **[Fig. 2; a block of scheduling flags 142; col. 4, lines 6-7];** and

individual event pipelines dedicated to individual ones of peers **[Fig. 2; e.g. a first and a second network interface queues 130 and 132 for managing each of interface peers, respectively; col. 3, lines 55-59]**; wherein events received for processing are posted in their associated event pipelines according to the source of the events, pipelines having events to be processed insert a flag in the ready list **[Fig. 2; A scheduling flag is used to indicate that a task has pending work and to signal the scheduler 53 that the task needs to be invoked; col. 4, lines 6-15]**, and the scheduler repetitively scans the ready list sequentially **[Fig. 5, steps 515-520- 540-515; scan the block of scheduling flags 142 based on a round-robin algorithm, i.e. sequentially; col. 3, lines 27-28, col. 7, line 61 – col. 8, line 15]**, and releases events to the processor resource with preset limitation per pipeline **[Fig. 5, steps 540-550; yielding the processing resources once all the scheduling flags are scanned or due to the time limitation; col. 8, lines 15-17; col. 3, lines 62-67]**.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to incorporate a scheduler with a block of scheduling flags, i.e. a ready list, to sequentially scan the pending events/tasks as taught by Vaitzblit into Alfieri's context selection logic or scheduler of the edge router, since both inventions are directed to the multiple tasks/events scheduling within a network device.

The motivation for combining the reference teachings would be to enable Alfieri's edge router to achieve improved performance even in a very large network with a large number of routes without involving expensive or extensive hardware or software modification.

Regarding claims 2, 7 and 12, Alfieri, in view of Vaitzblit, teaches individual ones of the BGP peers are virtual private routed networks (VPRNs) away from the packet network **[Alfieri: Fig. 1; VPRNs 1-3; col. 2, line 60 – col. 3, line 29]**.

Regarding claims 3, 8 and 13, Alfieri, in view of Vaitzblit, teaches the edge router wherein the preset limitation is a time limitation **[Vaitzblit: Fig. 2; col. 3, lines 62-67]**.

Regarding claims 4, 9 and 14, Alfieri, in view of Vaitzblit, the edge router wherein the preset limitation is a buffer limitation **[Vaitzblit: The real-time class 120 scheduling is suitable for tasks that require guaranteed throughput and bounded delay, which are obviously subjected to the buffer limitation; col. 3, lines 44-54]**.

Regarding claims 5, 10 and 15, Alfieri, in view of Vaitzblit, teaches the edge router comprising a first scheduler, a first ready list, and pipelines dedicated to events associated with both VPRNs and core BGP peers in the service provider network **[Alfieri: Fig. 1; Routers 14 in Wide Area Routed Network 10; col. 3, lines 4-29]**, wherein the pipelines associated with VPRNs communicate with the first scheduler and the first ready list **[See the rejection statements to claims 1 and 2 above]**.

Alfieri, in view of Vaitzblit, does not expressly teach the edge router comprising a second scheduler, a second ready list, and the pipelines associated with the core BGP peers communicate with the second scheduler and the second ready list.

However, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to recognize that the edge routers 14 in Alfieri may implement a second scheduler, a second ready list, and the pipelines associated with the core BGP peers communicate with the second scheduler and the second ready list in the same way just like scheduling for VPRNs 1-3 to one side of the edge routers 14. Thus, the limitations set forth in the claim 5 do not depart from the combining invention scope of Alfieri in view of Vaitzblit as recited in the rejection statements to claims 1 and 2.

Regarding claims 6 and 11, Alfieri teaches a method and a machine-readable medium having stored instructions that cause the method for processing events in Border Gateway Protocol (BGP) peering in an edge router in a packet network **[Figs. 1-5; Edge Routers 14 operating BGP in Wide Area Routed Network 10; col. 3, lines 8-22, col. 5, lines 28-30]**, comprising acts of:

(a) placing received events associated with BGP peers in dedicated pipelines according to the BGP source **[Fig. 5; A context selection logic 64 is a task scheduler for scheduling tasks 60 (including BGP tasks) and multiple tasks 60 time-share the same physical processor in the Router 14 for processing task events; col. 5, lines 35-43]**.

Alfieri does not expressly teach: (b) flagging a ready list by individual pipelines having events ready to be processed; and (c) scanning the ready list sequentially and

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repeatedly by a scheduler, the scheduler sending events for each pipeline to be processed to a processing resource according to a preset limitation per pipeline.

Vaitzblit teaches a scheduler with a weighted round-robin scheduling schemes in a network device **[Figs. 1-2; a Video File Server 20 having a Scheduler 53; col. 3, line 17]** comprising steps of:

(b) flagging a ready list **[Fig. 2; a block of scheduling flags 142; col. 4, lines 6-7]** by individual pipelines having events ready to be processed **Fig. 2; e.g. a first and a second network interface queues 130 and 132 for managing each of interface pipelines to be processed; col. 3, lines 55-59]**; and

(c) scanning the ready list sequentially and repeatedly by a scheduler **[Fig. 5, steps 515-520- 540-515; scan the block of scheduling flags 142 based on a round-robin algorithm, i.e. sequentially; col. 3, lines 27-28, col. 7, line 61 – col. 8, line 15]**, the scheduler sending events for each pipeline to be processed to a processing resource **[Fig. 2; A scheduling flag is used to indicate that a task has pending work and to signal the scheduler 53 that the task needs to be invoked; col. 4, lines 6-15]** according to a preset limitation per pipeline **[Figs. 2 & 5; Tasks are defined to run for a limited time before yielding control to the scheduler col. 3, lines 62-67]**.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to incorporate a scheduler with a block of scheduling flags, i.e. a ready list, to sequentially scan the pending events/tasks as taught by



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Vaitzblit into Alfieri's context selection logic or scheduler of the edge router, since both inventions are directed to the multiple tasks/events scheduling within a network device.

The motivation for combining the reference teachings would be to enable Alfieri's edge router to achieve improved performance even in a very large network with a large number of routes without involving expensive or extensive hardware or software modification.

### ***Response to Remarks***

3. Applicant's Remarks with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert T. Chou whose telephone number is 571-272-6045. The examiner can normally be reached on 8:30 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham, can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Albert T Chou/

Examiner, Art Unit 2416

October 30, 2008